

Toronto Transit Commission

Existing Conditions Report – Highway 407 Subway Station Toronto–York Spadina Subway Extension

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- A. Fish Community and Fish Habitat Survey Information
- B. Plant Species List for Highway 407 Study Area

1. Introduction

This report presents the findings of baseline conditions studies undertaken as part of the Toronto York Spadina Subway Extension (TYSSE) for the Highway 407 Subway Station.

The proposed Highway 407 station location is located south of Highway 407, west of Jane Street and north of Steeles Avenue. A CN rail line runs east west at the southern extent of the study area; as shown in **Figure 1**.



Figure 1 Highway 407 Station Study Area

To document and evaluate the impacts of the proposed station construction on the existing natural environment a series of baseline studies were undertaken between April and July 2009. This involved data collection, a review of previous activities, secondary source data collection, and field inventories of the natural environment.

2. Aquatic Environment

2.1 Methodology

Electrofishing surveys were conducted in May, 2009 and again in June, 2009 as a means of collecting information regarding early and late migrating fish species present within Black Creek (**Figure 2**). Surveys were conducted using a Smith Root Model backpack electrofishing unit

Habitat surveys were conducted to document in-stream habitat features and the overall contribution of the drainage features to fish habitat in Black Creek.

Information collected included:

- a) mapping of fish habitat features (critical habitats);
- b) flow characteristics of features, with particular emphasis on fish habitat availability;
- c) channel morphological characteristics; and
- d) riparian characteristics

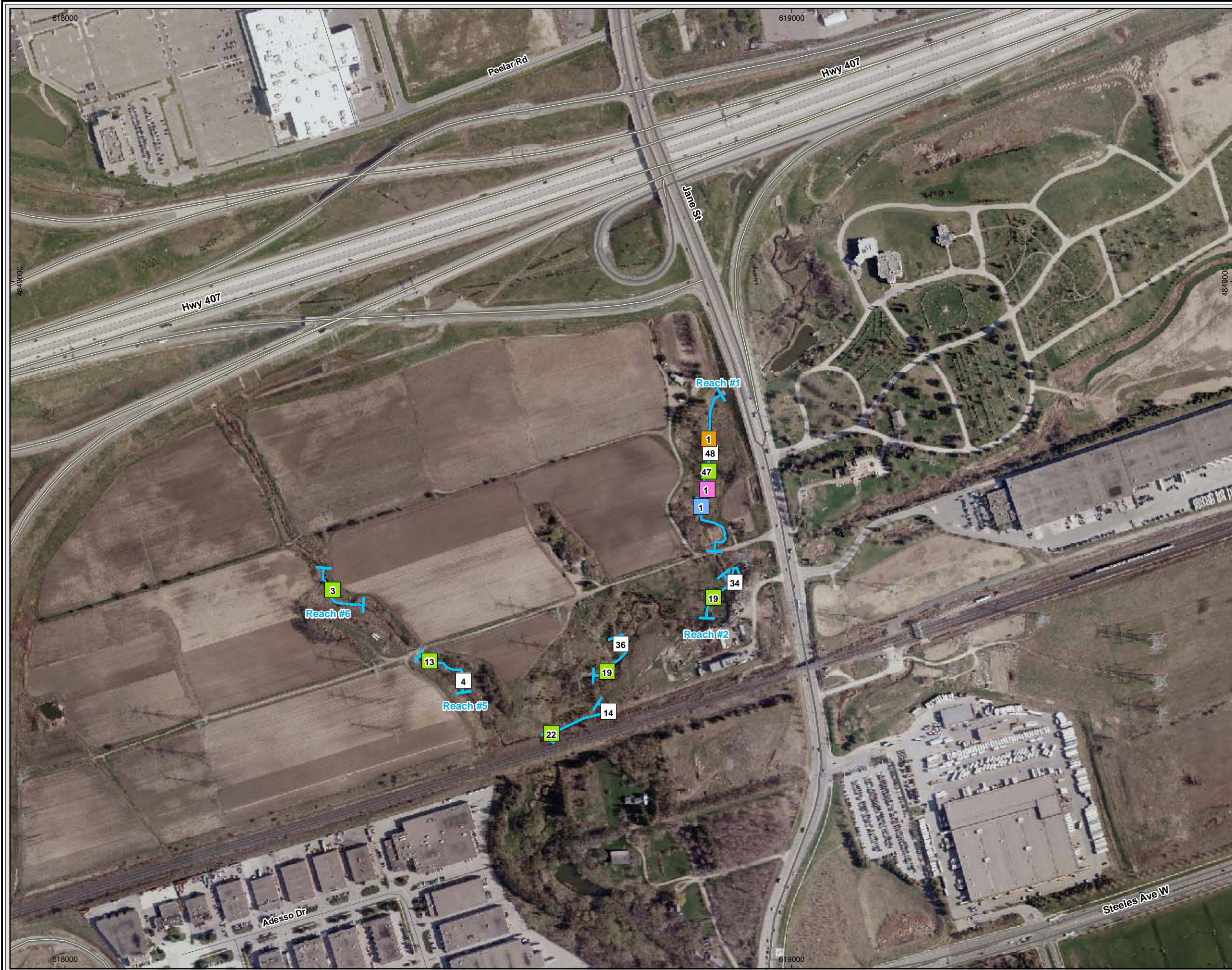
For the purpose of field surveys the East and West tributaries of Black Creek were broken into individual reaches. Reach 1 represents the section of Black Creek proposed for realignment. Reaches 2 through 6 are representative sections of the remainder of the tributaries. Habitat features associated with Reach 1 were assessed in more detail than the other reaches since these features will be lost or altered as a result of the stream alignment.

Detailed information from Reach 1 will be used to prepare appropriate restoration and compensation in the realigned segment of the creek.

Fish and habitat Information collected during the field assessment has been summarized in **Table 1** and appear in detail in **Appendix A**.

2.2 Aquatic Habitat Assessment

Information regarding fish community and fish habitat within Black Creek is discussed below. Fish habitat information is presented in **Figures 2 and 3**. Detailed photographs of key features within each of the assessed segments is provided in the relevant section of this report.



Legend

Fish Species Sampled Count

- Blacknose Dace
- Bluegill
- Creek Chub
- Pumpkinseed
- White Sucker
- Electrofished Stream Reach
- Number of Fish Collected

Basemapping from Ontario Ministry of Natural Resources
Orthophotography: 2007

0 25 50 100 150 200
m
1:5,000
UTM Zone 17N, NAD 83

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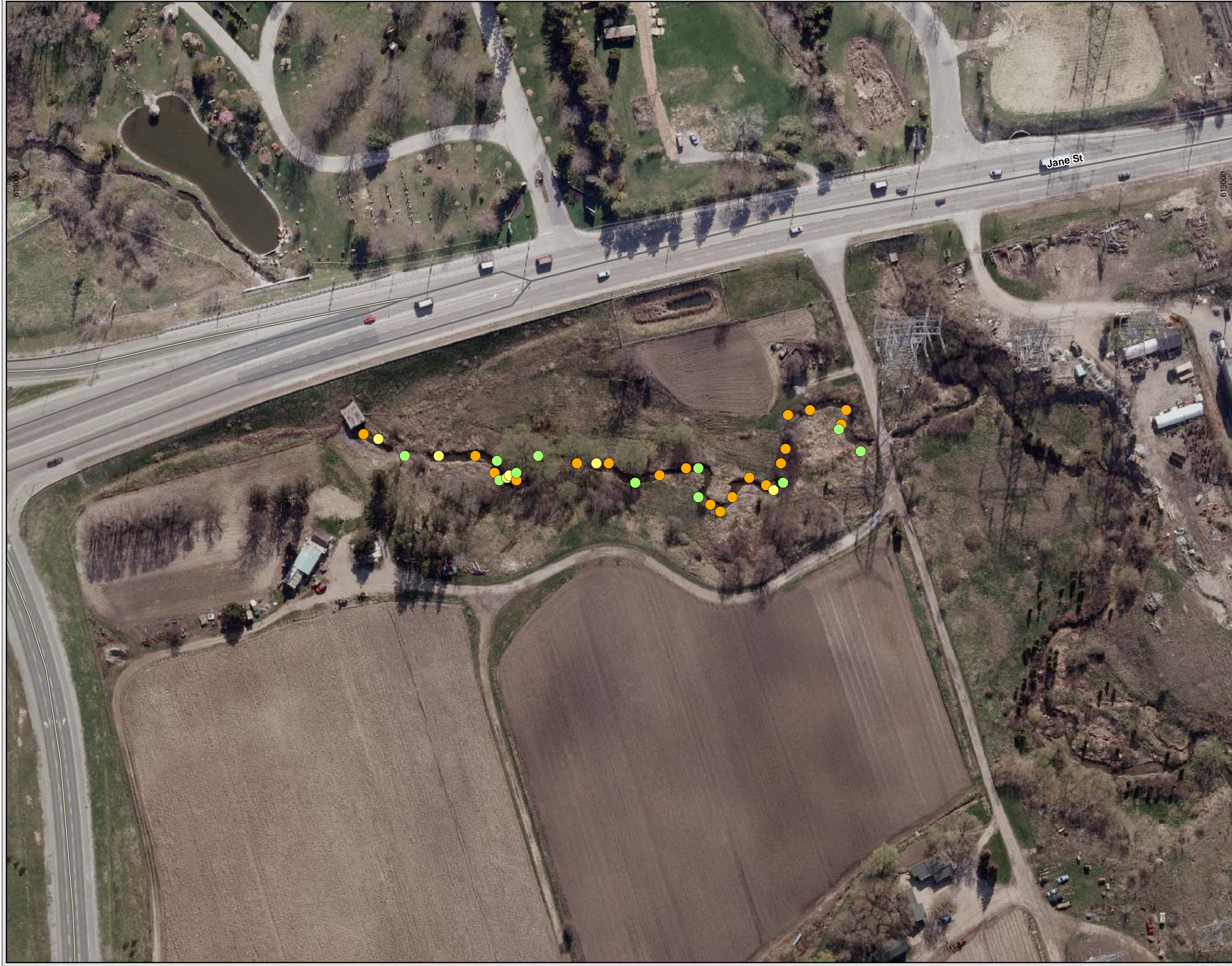
TORONTO-YORK SPADINA SUBWAY EXTENSION
HIGHWAY 407 STATION

Fish Community
August 2009
Project 107257



Figure 2

Map Document: N:\projects\107257\2009\Final\GIS\Spatial\MXDs\Working\MXD\107257\StreamReaches.mxd
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619000

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Basemapping from Ontario Ministry of Natural Resources
Orthophotography: 2007



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UTM Zone 17N, NAD 83

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- Legend**
- Pool Section
 - Riffle Section
 - Run Section



TORONTO TRANSIT COMMISSION
TYSSE DEPARTMENT

TORONTO-YORK SPADINA SUBWAY
EXTENSION
HIGHWAY 407 STATION

**Black Creek Fish
Habitat**
August 2009
Project 107257



Figure 3

Table 1 Fish Habitat Features of Black Creek Associated with the Highway 407 Study Area

Station Name	Watercourse	Mean Channel (m)		Flow/Thermal Regime	Habitat Notes
		Width (wetted)	Depth (average)		
Reach 1	East Tributary of Black Creek	3.0	0.3	▶ Permanent Warmwater	<ul style="list-style-type: none"> ▶ Originates north of Major Mackenzie Dr. and west of Weston Road ▶ Well defined channel- evidence of channel realignment near Jane St. culvert (riprap reinforced banks) ▶ Steep sloped banks with some slumping ▶ Good pool-riffle sequence ▶ Woody debris ▶ Bed material sand, gravel and cobbles ▶ Undercut banks ▶ Areas of discarded refuse (tires, oil drums) ▶ Riparian area willow trees and cultured meadow
Reach 2	East Tributary of Black Creek	2.8	0.28	▶ Permanent Warmwater	<ul style="list-style-type: none"> ▶ Originates north of Major Mackenzie Dr. and west of Weston Road ▶ Well defined channel ▶ Good pool-riffle sequence (deep pools) ▶ Woody debris ▶ Bed material sand, gravel and cobbles ▶ Areas of discarded refuse ▶ Drainage ditch flows into Reach 2 ▶ Riparian area low shrubs, willow trees and cultured meadow
Reach 3	East Tributary of Black Creek	3.50	0.34	▶ Permanent Warmwater	<ul style="list-style-type: none"> ▶ Originates north of Major Mackenzie Dr. and west of Weston Road ▶ Well defined channel ▶ Good pool-riffle sequence ▶ Woody debris ▶ Bed material sand, gravel and cobbles ▶ Areas of discarded refuse
Reach 4	East Tributary of Black Creek	2.6	0.3	▶ Permanent Warmwater	<ul style="list-style-type: none"> ▶ Originates north of Major Mackenzie Dr. and west of Weston Road ▶ Well defined channel-evidence of channel straightening ▶ Good pool-riffle sequence ▶ Bed material sand, gravel and cobbles ▶ Undercut banks ▶ Woody debris ▶ Riparian area low shrubs, willow trees and cultured meadow ▶ Areas of discarded refuse
Reach 5	West Tributary of Black Creek	3.0	0.33	▶ Intermittent Warmwater	<ul style="list-style-type: none"> ▶ Originates north of Highway 7 and east of Highway 400 ▶ Stream flows through large CSP culvert ▶ Substrates consist of sand, gravel and cobbles ▶ Riparian vegetation consists of low shrubs and willow trees ▶ Large deep pools ▶ Woody debris
Reach 6	West Tributary of Black Creek	2.50	0.40	▶ Intermittent Warmwater	<ul style="list-style-type: none"> ▶ Originates north of Highway 7 and east of Highway 400 ▶ Flows through cement culvert under Highway 407 into rip-rap lined receiving channel ▶ Narrow cattail and phragmites channel ▶ Poorly defined channel ▶ Agricultural drainage discharge ▶ Substrates consist of sand and silt with mucky areas and organics

2.2.1 Reach 1 (East Tributary of Black Creek)

Black Creek enters the study area through a concrete box culvert at the northeast corner of the study area. It flows in a southwesterly direction towards Steeles Avenue with a prominent meander. The creek channel is approximately 5-8 m west of Jane Street and contained within a well defined valley. Approximately 200 m south of the concrete culvert the creek passes through a double corrugated steel pipe (CSP) culvert under an unnamed access laneway. A small tributary enters the creek south of the culvert from the east. Just south of the tributary, the channel makes a tight turn to the west where it continues through the hydro corridor towards the CN rail line. This is Reach 1. From concrete culvert to hydro corridor it is approximately 300 m long.

Although the creek flows in a defined valley, it is surrounded by active agricultural areas. The study site itself is bordered on three sides by major transportation corridors: Highway 407 to the north, Highway 400 to the west and Jane Street to the east.

Habitat features within Reach 1 included riffles, runs and pools. The channel varies in width and depth over its length but can be categorized as 3.0 m wide and 0.3 m deep, on average. The bed material is mainly gravel and cobbles (80%) with finer sediments like sand in pool areas (15%) and areas of small boulders (5%). In stream habitat also consists of undercut banks and large woody debris. The entire channel shows signs of anthropogenic impacts including assorted debris ranging from vehicle tires, appliances and metal drums present within the water. In addition, garbage is present on and within the riparian vegetation along the bank.

In more detail, the upstream 40 m of the reach lacks any complex morphology and is typically of many channelized watercourses. The banks of the stream downstream of the culvert at Jane Street have been reinforced for approximately 20 m on both sides with riprap (Plate 1). There is evidence of water taking from this section as witnessed by the presence of a black pipe and associated pumps. At the time of the field investigation water was being extracted from the creek (lower left corner of Plate 2). Throughout the middle section of the reach the stream banks can be described as steeply sloped with evidence of slumping. Despite some bank erosion, approximately 85% of the stream banks remain vegetated and stable. Areas of erosion generally occur on tight meanders and adjacent to areas containing large woody debris. In general these areas are slightly (5%) to moderately (10%) unstable. The double culvert at the downstream section of the reach has been reinforced with sand bags but showed signs of recent erosion (Plate 3).

Aquatic vegetation is typically absent from the reach. Shoals along the shore and within the channel support various types of emergent grasses. Small shrubs were common along the banks. Algal growth occurs on most instream substrate, including those of anthropogenic origins. There is no evidence of groundwater (indicated by presence of watercress) within Reach 1. Riparian vegetation communities contain typical of cultural meadow and cultural wetland species

Plate 1 Riprap Reinforced Banks at Upstream section of Reach 1 below Jane Street culvert (looking downstream)



Plate 2. Straightened Channel 40 m downstream of Jane Street culvert Reach (looking downstream)



Plate 3. Culvert where creek flows beneath unnamed access road (looking downstream at culvert opening)



boulders. Finer sediments like silt occur in pool areas (5%; Plate 5). Throughout the reach banks are undercut and contain medium to large woody debris.

Stream banks are steeply sloped but show less sign of erosion than observed Reach 1; with approximately 90% of the stream banks vegetated and stable. The absence of large meander over the reach likely contribute to the observed stability of the stream banks.

Aquatic vegetation in Reach 2 is similar to that of Reach 1. The dominant vegetation is emergent grass species found on small shoals within the stream. Algal growth occurs on substrates and debris throughout the reach. There is no evidence of groundwater (indicated by presence of watercress) within Reach 2. Riparian vegetation communities consist of cultural meadow shrub and willow thickets. Shade and cover is provided by large shrubs and willow trees randomly occurring throughout the reach (Plate 6).

Plate 4. Double CSP culvert at top of Reach 2 (looking upstream)



Plate 5. Channel characteristics of Reach 2 (looking downstream from the culvert)



Plate 6. Typical riparian vegetation of Reach 2 (looking downstream).



2.2.2 Reach 2 (East Tributary of Black Creek)

Reach 2 is approximately 130 m long, and flows through a double CSP culvert (Plate 4) in a southwesterly direction towards Steeles Avenue through a small valley. It is bordered by cultural meadow and agricultural fields to the north, Jane Street to the east and train tracks to the south. Instream habitat features of this reach include riffles, runs and pools. The average channel depth is 2.8 m and its width was 0.28 m. The pools in Reach 2 are deeper than those of Reach 1 and would provide suitable refuge for fish. The bed material is mainly sand, gravel and cobbles (90%) with limited (5%) small

2.2.3 Reach 3 (East Tributary of Black Creek)

Reach 3 flows in a southwesterly direction towards Steeles Avenue through a cultural meadow valley. Reach 3 is approximately 90 m long. The creek is surrounded by cultural meadow, willow trees, shrubs and a railroad to the south. The stream contains riffles, runs and pools. On average, the channel is approximately 3.5 m wide and 0.34 m deep.

Reach 3 displayed more diversity in its morphology than Reach 2; having a greater number of riffle sections and well defined pools. Stream bed material is mainly gravel and cobbles (80%) with finer sediments like sand occurring in pool areas (15%). Small boulders (5%) occur throughout the reach. In stream habitat also consisted of undercut banks and woody debris. At one location woody debris accumulated has created an observable restriction in flow; functioning similar to a wier (Plate 7). It is possible that this debris blocks fish passage. There are areas in the stream with human refuse, including several vehicle tires and assorted garbage. The stream banks in Reach 3 are well vegetated with erosion occurring at many meander points (Plate 8).

Aquatic vegetation consists of emergent grasses and coverage is sparse throughout the reach. Similar to Reaches 1 and 2, vegetation is limited to shoals in the stream. Algal growth occurs on instream substrates. There is no evidence of groundwater (indicated by presence of watercress) throughout reach 3 of Black Creek. Riparian vegetation communities consist of cultural meadow species and shoreline shrubs and trees are abundant and provide excellent stream cover (Plate 9).

Plate 9. Riparian cover characteristics of the lower portion of reach 3 (looking downstream)



2.2.4 Reach 4 (East Tributary of Black Creek)

Reach 4 flows in a westerly direction parallel with the railroad, then flows south through a large CSP culvert towards Steeles Avenue. The reach is approximately 120 m long. The creek is surrounded by a cultural meadow, agricultural fields, and a railroad to the south. The stream contains riffles, runs and pools. On average, the channel is approximately 2.6 m wide and 0.3 m deep. The bed material is mainly sand and silt (60%) with smaller proportions of gravel and cobbles (35%) and small boulders (5%). Most of the reach contains undercut banks. Woody debris occurs throughout the reach.

Reach 4 lacks any form of complex morphology, such as riffle-pool areas. The reach is predominantly a run-glide habitat, typical of a channelized watercourse (Plate 10). Characteristically, Reach 4 contains shallow sloped banks that are heavily. Approximately 85-90% of the stream banks within Reach 4 are stable. There only significant evidence of extensive erosion occurs mid way through the reach and is associated with a tight bend; possibly due to the inclination created by the railroad construction (Plate 11).

Aquatic vegetation is typically absent from Reach 4. Algae occurs on rocks and other instream debris throughout the reach. There is no evidence of groundwater (indicated by presence of watercress) throughout reach 4 of Black Creek. Riparian vegetation communities consist of cultural meadow shrub and willow thickets which provided excellent stream cover (Plate 12).

Plate 7. Channel restriction in Reach 3 due to fallen tree and accumulated vegetation (looking upstream at the obstruction)



Plate 8. Typical stream bank showing riparian vegetation of Reach 3 (looking downstream)



Plate 10. Straightened channel in Reach 4 (looking upstream)



Plate 11. Stream Bank Erosion in Reach 4 (looking downstream mid reach)



Plate 12. Riparian vegetation in Reach 4 (looking upstream mid reach)



There is very little aquatic vegetation in Reach 5. Not unlike upstream reaches, emergent grasses are the abundant form of vegetation and occurred commonly on instream shoals. Algal growth occurs on substrates throughout the reach. There is no evidence of groundwater (indicated by presence of watercress) throughout reach 5 of Black Creek. Riparian vegetation communities consist of cultural meadow with willow and shrub thickets which provide medium density stream cover (Plate 14).

Plate 13. Double CSP culvert top of Reach 5 (looking downstream)



Plate 14. Riparian vegetation at Reach 5 (looking downstream)



2.2.6 Reach 6 (West Tributary of Black Creek)

Reach 6 is approximately 100 m long and is located in the West Tributary of Black Creek. The West Black Creek tributary originates north of Highway 407 in Vaughn and flows through a series of stormwater ponds before flowing under Highway 407 through a large cement box culvert. Downstream of the culvert the creek flows into a riprap lined channel which also receives runoff from the east and west flowing ditches. The stream flows in a southeasterly direction towards Steeles Avenue through a cultured wetland surrounded by agricultural fields. The stream contains run/flat and small pool sequences. On average, the channel was approximately 2.5 m wide and 0.4 m deep. The bed material is mainly silt and sand, with some organic material, gravel and cobbles. The stream banks within reach 6 are typically flat or gradually sloping (Plate 15).

Aquatic vegetation in Reach 6 differed from other reaches. There are fewer areas of emergent grass species and more areas containing cattails and phragmites. Algae growth in this reach is typical of other reaches of Black Creek. There is no evidence of groundwater (indicated by presence of watercress) throughout reach 6 of Black Creek. Riparian vegetation communities consist of agricultural and cultured wetland dominated by cattail species and phragmites (Plate 16).

2.2.5 Reach 5 (West Tributary of Black Creek)

Reach 5 is approximately 105 m long and is located in the a Tributary of Black Creek, west of the primary study area. This tributary flows in a southeasterly direction towards Steeles Avenue through a cultured meadow and cultured wetland valley. Agricultural field line both sides of the creek in this area. The upper section of Reach 5 originates from a large pool at the culver outfall(Plate 13). Downstream from that point the stream is a series of riffle, run and pool sequences. Channel width and depth vary over the reach but on average, the channel is 3.0 m wide and 0.33 m deep. The bed material is mainly sand, gravel and cobbles (80%) with finer sediments like silt (15%) and small boulders (5%) occurring in pools. In stream habitat includes undercut banks and submerged and emerged woody debris. There are areas in the stream with tire refuse, and fallen trees. The stream banks within reach 5 are gradually sloped and well vegetated.

Plate 15. Riparian cover in Reach 3 (looking downstream)



Plate 16. Stream banks in Reach 3 (looking downstream)



2.3 Fish Community

In 2009, AECOM Aquatic Ecologists recorded Creek Chub (*Semotilus atromaculatus*), White Sucker (*Catostomus commersonii*), Blacknose Dace (*Rhinichthys atratulus*), Pumpkinseed (*Lepomis gibbosus*), and Bluegill (*Lepomis macrochirus*) in Reach 1, and Creek Chub and White Sucker at Reaches 2-6 (Table 2). Most fish were observed and captured in the pool features of Black Creek. The pools are large and deep and provided suitable refuge for all of the collected fish species.

Table 2 Fish Present in Sampled Reaches of East and West Black Creek Tributaries

Common Name of Species	Scientific Name	Reach					
		Reach 1	Reach 2	Reach 3	Reach 4	Reach 5	Reach 6
Blacknose Dace	<i>Rhinichthys atratulus</i>	1	0	0	0	0	0
Bluegill	<i>Lepomis macrochirus</i>	1	0	0	0	0	0
Creek Chub	<i>Semotilus atromaculatus</i>	58	19	19	22	13	3
Pumpkinseed	<i>Lepomis megalotis</i>	1	0	0	0	0	0
White Sucker	<i>Catostomus commersonii</i>	59	34	36	14	4	0

3. Terrestrial Environment

3.1 Vegetation

3.1.1 Methodology

An AECOM terrestrial ecologist conducted a plant community inventory in June of 2009. The vegetation communities were classified according to the standardized method of Ecological Land Classification (ELC; Lee *et al.* 1998), with classification taken to the ecosite level where possible. This system of classification is a province wide approach that standardizes classifications based on broad community types and dominant species associations. Vegetation communities accessible to the Terrestrial ecologist were classified to the finest level of vegetation type possible.

3.1.2 Vegetation Communities

Agriculture is a dominant land use type in the study area. Vegetated areas occur primarily within the Black Creek valley and the hydro corridor to the south of the study area. The majority of the vegetation within these areas is a result of anthropogenic disturbances, arranged into 'cultural' communities that are maintained by human activities.

Five vegetation community types were identified, consisting of 4 cultural communities and 1 aquatic community.

3.1.2.1 Forests

No forest communities were identified within the study area. All wooded areas did not meet the classification requirements as identified by the standards of the ELC manual.

3.1.2.2 Aquatic Communities

Only one aquatic feature was identified during field investigation.

- SAF1 Floating-leaved Shallow Aquatic Ecosite

This aquatic site is dominated by floating leaved vegetation.

3.1.2.3 Cultural Communities

For cultural polygons, the majority of the subject lands are composed of young to mid-aged culturally defined vegetation communities, including cultural meadow, Cultural woodlands, cultural thicket and cultural hedgerow.

- CUH Cultural Hedgerow

These communities are usually found along the borders of agricultural fields and typically do not provide significant habitat for either flora or fauna species. Within the study site they are made up of Siberian Elm (*Ulmus pumila*), and White Spruce (*Picea glauca*).

- CUM1-1 - Dry-Moist Old Field Meadow Type

Abandoned agricultural fields that are reverting to naturally vegetated areas are classified as cultural meadows under ELC methodology, and are usually composed of a mixture of grass and herbaceous plant species. Old-fields, account for large portion of the cultural communities within the study area. Common species found in these old fields include Smooth Brome (*Bromus inermis*), Teasel (*Dipsacus fullonum*), Queen Anne's Lace (*Daucus carota*), Common Milkweed (*Asclepias syriaca*), Canada Goldenrod (*Solidago canadensis*), and Canada thistle. The absence of a shrub layer in these fields indicates that they have been exposed to disturbance within the last few years.

- CUW1 Mineral Cultural Woodland

Cultural woodlands are defined as an area with a relatively recent history of human disturbance, with tree canopy cover between 35 and 60%. Several Cultural Woodlands are found within the study lands. The woodlands are low in quality, and have a sparse under story. They are typically comprised of Manitoba Maple, but others include Black Walnut (*Juglans nigra*) and Butternut (*Juglans cinerea*).

- CUT1 Mineral Cultural Thicket

Cultural Thickets are defined as tree cover <25% and >25% shrub cover. One thicket is found encompassing the aquatic community and is primarily composed of Willow species.

The Ontario Natural Heritage Information Centre (NHIC) compiles, maintains and distributes information on natural species, plant communities and spaces of conservation concern in Ontario. According to the NHIC none of the communities identified at the Highway 407 location are significant or rare within the province of Ontario. Vegetation communities are mapped in **Figure 4**.

3.1.3 Flora

A total of 57 plant species were identified in the subject lands during field investigations (**Appendix B**). Thirty-three species are non-native, representing 58% of the total number identified.

Terrestrial species significance was evaluated against national, provincial and regional criteria. National (COSEWIC) and Provincial (COSSARO) rankings were consistent with those posted on the Natural Heritage Information Centre (NHIC) database. Provincially rare species were those ranked as S1-S3 by NHIC. Regional significance was based on rarity rankings assigned in Site District 7E4 by Varga et al. (2000).

One endangered species and one regionally rare species occur on the Highway 407 study lands.

Provincially endangered Butternut (*Juglans cinera*) trees were located within the Black Creek valley approximately 35 southwest of the Jane Street culvert. Two trees were found on the study site. A certified Butternut Health Assessor assessed both trees and determined that they were in good condition, with one producing a seed set. A meeting was held with the Ministry of Natural Resources (MNR) forester and subsequent correspondence from the MNR confirmed that both specimens were a pure strain of Butternut and will require applicable consideration in accordance with the

Ontario Endangered Species Act. Butternut are also as a federal Species at Risk, however this Species at Risk act does not apply at this site as the lands are not federally owned.

Three specimens of Black Walnut (*Juglans nigra*) were identified within the Highway 407 study area. These trees were in the same general area adjacent to Black Creek as the Butternut. Black walnut is considered to be regionally rare in York Region.

3.2 Wildlife

Wildlife surveys were conducted for breeding birds, small to medium mammals and amphibians; as noted below.

3.2.1 Breeding Birds

Breeding bird surveys were conducted in order to assess wildlife attributes of the subject lands. Habitat requirements are generally understood for many bird species, making them relatively valuable indicators of habitat quality function and landscape connectivity.

3.2.1.1 Methodology

Breeding bird surveys were conducted on May 26 and June 16, 2009 according to protocols developed by the Ontario Breeding Bird Atlas (2008). Surveys were completed on calm, clear days between 05:00 and 11:00 hrs during peak periods of singing and breeding behaviour. Surveys included vegetated areas, including thickets along the southern access road adjacent to the Hydro One easement. Lands west of the rail line were assessed by BEACON Environmental. Bird species were common to lands east and west of the rail line, with the exception of House Sparrow. A single observation of this species was recorded by BEACON west of the rail line.

3.2.1.2 Breeding Bird Community

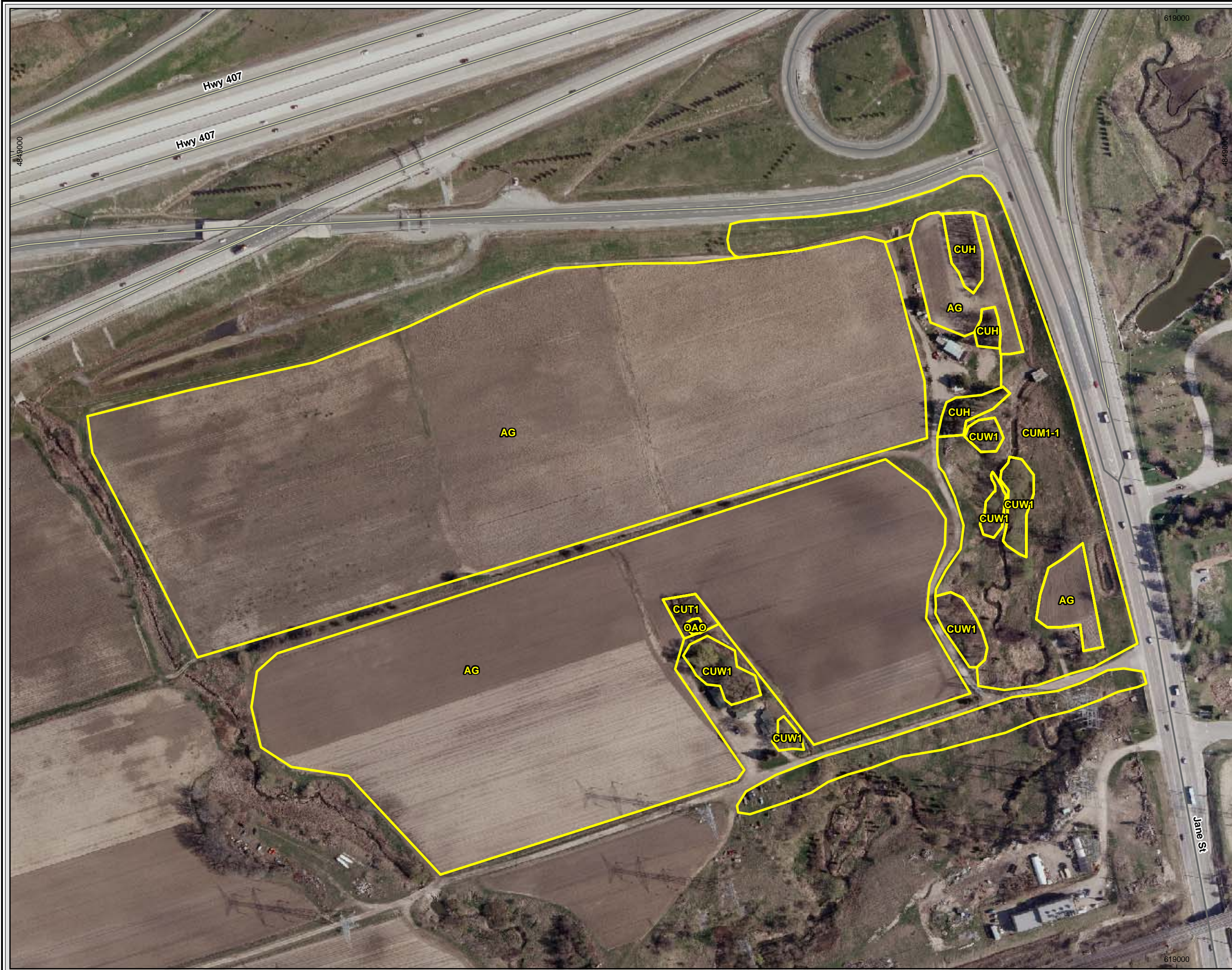
AECOM identified 13 bird species were detected during May and June breeding bird surveys. All of these were believed to be breeding in the subject lands. Two species, the European Starling (*Sturnus vulgaris*) and House Sparrow (*Passer domesticus*) are non-native (**Table 3**).

In general the observed species are, disturbance tolerant bird species found in urban areas and small woodlots and common to southern Ontario. European Starling (*Sturnus vulgaris*), Canada Goose (*Branta Canadensis*) and Red-winged Blackbird (*Agelaius phoeniceus*) were the most frequently detected bird species.


Two species; Savannah Sparrow and Eastern Meadowlark, are considered to be grassland sensitive species (OMNR 2000), however, both are relatively common throughout southern Ontario.

None of the observed species are provincially or regionally rare in Ontario. None of the species observed are "Species at Risk".

Map Document: (N:\projects\0-aecom\107257\2009\Final\GIS\Spadina\MXDs\Working\MXDs\107257\ELC.mxd) 08/31/2009 7:44:45 AM

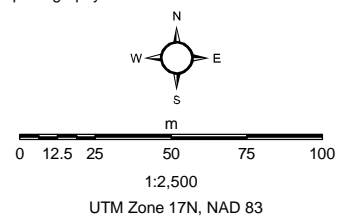


Legend


 Vegetation Communities

- CUH - Cultural Hedgerow
- CUW1 - Cultural Deciduous Woodland
- CUM1-1 - Dry Moist Old Filed Meadow
- OAO - Open Aquatic
- AG - Agriculture

Basemapping from Ontario Ministry of Natural Resources
Orthophotography: 2007



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 **Toronto-York Spadina
Subway Extension**
TORONTO TRANSIT COMMISSION
 TYSSE DEPARTMENT

TORONTO-YORK SPADINA SUBWAY EXTENSION
HIGHWAY 407 STATION

Vegetation Communities

August 2009
Project 107257

AECOM

Figure 4

Table 3 Breeding Bird Survey Data for the Highway 407 Study Area

Common Name	Scientific Name	A = Area-sensitive Species (OMNR)	Numbers of Presumed Pairs at Locations
Killdeer	<i>Charadrius vociferus</i>		3
Spotted Sandpiper	<i>Actitis macularia</i>		1
Mourning Dove	<i>Zenaida macroura</i>		1
Willow Flycatcher	<i>Empidonax traillii</i>		1
Eastern Kingbird	<i>Tyrannus tyrannus</i>		2
N. Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>		1 f
Black-capped Chickadee	<i>Poecile atricapillus</i>		1
American Robin	<i>Turdus migratorius</i>		4
Northern Mockingbird	<i>Mimus polyglottus</i>		1
Gray Catbird	<i>Dumetella carolinensis</i>		2
Cedar Waxwing	<i>Bombycilla cedrorum</i>		2
European Starling	<i>Sturnus vulgaris</i>		7 f
Warbling Vireo	<i>Vireo gilvus</i>		1
Yellow Warbler	<i>Dendroica petechia</i>		3
Northern Cardinal	<i>Cardinalis cardinalis</i>		1
Song Sparrow	<i>Melospiza melodia</i>		4
Red-winged Blackbird	<i>Agelaius phoeniceus</i>		6
Common Grackle	<i>Quiscalus quiscula</i>		2
Brown-headed Cowbird	<i>Molothrus ater</i>		9
Baltimore Oriole	<i>Icterus galbula</i>		2
American Goldfinch	<i>Carduelis tristis</i>		2

Notes: f = some or all individuals feeding and not breeding on site, starling numbers include young of the year
Area-sensitive source: Ontario Ministry of Natural Resources (OMNR). 2000. Significant Wildlife Habitat Technical Guide. 151 p plus appendices.

3.2.2 Small and Medium Mammals

Mammal surveys were completed during breeding bird and amphibian surveys and involved incidental observations of presence absence within the study area. One mammal species was observed during AECOM field surveys. The Eastern Grey Squirrel (*Sciurus carolinensis*) was observed within the valley land.

3.2.3 Amphibians

Amphibian surveys were conducted at two points during the field season; in April 2009 and June 2009. No frog calls were heard at either of the call surveys.

3.3 Significant Species

The Natural Heritage Information Centre (NHIC) was consulted for occurrences of nationally (COSEWIC) and/or provincially (COSSARO) designated Species at Risk and Provincially Rare Species (S1-S3) within the subject lands. A search of the database provided no records of any significant species previously found within the study site. However, as previously noted two specimens of the endangered Butternut were found within the subject lands that were not previously documented in existing background literature for this area.

3.4 Habitat Connectivity

Existing vegetation units in southern Ontario have been highly fragmented by agricultural land, residential subdivisions and roads. Fragmentation results in the reduction of total habitat available, and the isolation of remaining patches (Noss 1987). Retaining connections between the remaining vegetation units can protect the functionality of these communities and in theory minimize some of the negative impacts associated with habitat fragmentation. Landscape connectivity is defined as the “degree to which the landscape facilitates or impedes movement across habitat patches” (Taylor et al. 2006), and includes concepts such as wildlife corridors. Due to intense habitat loss and increasing fragmentation of existing habitat patches in southern Ontario, habitat connectivity has become an important component of natural heritage planning.

Linkages or corridors can vary in size and configuration, from minor connectors such as hedgerows to massive kilometre wide features such as the Oak Ridges Moraine. Depending on the ultimate goal, corridors can be used to connect terrestrial features, aquatic features or both. Properties of a corridor such as configuration, width, vegetation structure and moisture, dictate what wildlife species are most likely to utilize the feature, and provide insight into functional connectivity.

The value of habitat connectivity of the study site is limited. For one, there are no significant woodlands in close proximity to the study site, indicating that the quality of habitat provided by the study site and surrounding natural areas is minimal. Two, the site is located in an urban environment that has a significant level of development and human use including agriculture, commercial and industrial.

3.5 Designated Areas

3.5.1 Wetlands

Wetlands are defined as lands that are either flooded by shallow water or areas where the water table is close to the surface, have soils that are characteristic of water saturation, and have vegetation that has adapted to wet conditions (Mitch and Gosselink, 2000). Wetlands are evaluated by the OMNR according to the Ontario Wetland Evaluation System (1994), in which the importance of a wetland is determined based on biological, social, hydrological and special features. Evaluated wetlands are categorized as either provincially or locally significant. These designations protect wetlands from development and alterations according to the Provincial Policy Statement (PPS, 2005).

There are no Provincially Significant Wetlands (PSW) found within the subject lands.

3.5.2 Areas of Natural and Scientific Interest

An Area of Natural and Scientific (ANSI) is defined by the OMNR as an area that contains natural features that are provincially or regionally significant (NHIC). Earth Science ANSIs contain important geological features, and Life Science ANSIs contain representative ecological features. ANSIs are considered to be the best representation of a

natural area within each site district and can be considered as an ecological benchmark. Provincially designated ANSIs are protected from development under the PPS.

There are no provincially or regionally designated Areas of Natural and Scientific Interest (ANSI) within the subject lands.

3.5.3 Environmentally Sensitive Areas

An area that has ecological significance may be identified as an Environmentally Significant Area (ESA) and designated for protection by a municipality or Conservation Authority. Often times, ESAs overlap with designated ANSIs.

There are no designated Environmentally Sensitive Areas within the subject lands.

3.5.4 York Region Significant Woodland Study

York Region has identified significant woodlands in the Region of York. This undertaking is aimed to comply with the Provincial Policy Statement (PPS) which does not allow development and site alteration in woodlands designated as significant, south and east of the Canadian Shield (PPS 2005). In addition to providing a woodland layer, the study aims to identify future opportunities for restoration and stewardship of woodlands within their jurisdiction.

To be designated as significant, woodlands had to fulfill at least one of the five following criteria:

1. any woodland that supports any globally significant (G1-G3), provincially rare (S1-S3), nationally (COSEWIC) and/or provincially (COSSARO) designated Species at Risk;
2. any woodland that is within 30 m of a water feature including watercourses, surface water features and/or wetlands;
3. any woodland over 2 ha in size that is within 100 m of another significant feature, and/or, occurring within the Regional Greenlands System;
4. any woodland south of the Oak Ridges Moraine that is at least 4 ha in size; and
5. any woodland north of the Oak Ridges Moraine that is at least 10 ha in size.

No significant woodlands were found within the subject lands.

3.6 Summary of Key Attributes and Functions

The following **Table 4** summarizes the attributes and functions that are important within the study area, and for which consideration should be provided during the planning process.

Table 4 Key Natural Heritage Attributes and Functions

Function	Present on Site	Attribute	Location	Significance / Sensitivity
Vegetation	▶ Yes	▶ Provincially Rare Flora (Butternut)	▶ Two specimens found within a Cultural woodlot	▶ Provincially Rare
	▶ Yes	▶ Regionally Rare Flora (Black Walnut)	▶ Several Specimens found within a Cultural woodlot	▶ Regionally rare in York Region
Wildlife	▶ Yes	▶ Common Species	▶ Valleylands	▶ Not significant
Birds	▶ Yes	▶ Common Species	▶ Valleylands	▶ Not significant

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Appendix A

Fish Community and Fish Habitat Survey Information

Appendix A. Life History Characteristics of the 2009 Fish Found in the TTC Black Creek Environmental Assessment Study Area

COMMON NAME	SCIENTIFIC NAME	GRANK	NRANK	SRANK	COSEWIC	ORIGIN (Ontario)	ABUNDANCE	TOLERANCE	GENERAL HABITAT	THERMAL REGIME	TROPHIC CLASS	SPAWNING SEASON	HABITAT	NOTES
Blacknose Dace	<i>Rhinichthys obtusus</i>	G5	N5	S5	-	native	common	tolerant	riverine	coolwater	generalist	spring	riffles and runs of cool, small- to medium-sized streams with moderate to steep gradient and gravel substrate; rarely lakes	formerly considered a subspecies of <i>Rhinichthys atratulus</i>
Creek Chub	<i>Semotilus atromaculatus</i>	G5	N5	S5	-	native	common	tolerant	riverine	coolwater	generalist	spring	pools of clear creeks and small rivers; rare in lakes and large rivers; preferred water temperature 20.8°C	hybrids occur with redbreast dace, common shiner, longnose dace and central stoneroller; tolerant of pollution
Pumpkinseed	<i>Lepomis gibbosus</i>	G5	N5	S5	-	native	common	intermediate	lacustrine riverine	warmwater	generalist	spring summer	warm, shallow, vegetated lakes and ponds; quiet vegetated pools of creeks and small rivers; preferred water temperature 26.0°C	hybrids with bluegill are common and hybrids with other sunfishes (<i>Lepomis</i> spp.) are known
White Sucker	<i>Catostomus commersonii</i>	G5	N5	S5	-	native	common	tolerant	lacustrine riverine	coolwater	generalist	spring	pools and riffles of creeks and rivers, warm shallow lakes and embayments of larger lakes usually at depths of 6-9 m; preferred water temperature range 22-26°C	very tolerant of polluted waters; hybrids with longnose sucker are reported
Bluegill	<i>Lepomis macrochirus</i>	G5	N5	S5	-	native	common	intermediate	lacustrine riverine	warmwater	generalist	summer	vegetated small lakes, ponds, shallow weedy bays of larger lakes and pools of creeks and small to large rivers; preferred water temperature range 24-30°C	hybrids with Pumpkinseed are common; usually spawn 2-3 weeks after Pumpkinseed; moderately tolerant of turbidity; intolerant of siltation; often occur in schools

Table created using data from The Ontario Freshwater Fish Life History Database (<http://www.fishdb.ca/home.htm>) accessed September 3, 2008

COSEWIC Status: Species designation assigned by the Committee on the Status of Endangered Wildlife in Canada.

Extinct (X): A wildlife species that no longer exists.

Extirpated (XT): A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.

Endangered (E): A wildlife species facing imminent extirpation or extinction.

Threatened (T): A wildlife species likely to become endangered if limiting factors are not reversed.

Special Concern (SC): A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats

Not at Risk (NAR): A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.

Data Deficient (DD): A wildlife species for which there is inadequate information to make a direct, or indirect, assessment of its risk of extinction.

GRank (Global Rank): Global conservation status ranks are assigned by NatureServe scientists with input from relevant natural heritage member programs and experts on particular taxonomic groups. These ranks reflect an assessment of the condition of the species across its entire range.

GX: Presumed Extinct; not located despite intensive searches and virtually no likelihood of rediscovery.

GH: Possibly Extinct; missing; known from only historical occurrences but still some hope of rediscovery.

G1: Critically Imperiled; at very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.

G2: Imperiled; at high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.

G3: Vulnerable; at moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.

G4: Apparently Secure; uncommon but not rare; some cause for long-term concern due to declines or other factors.

G5: Secure; common, widespread, and abundant.

G#G#: Range Rank; a numeric range rank is used to indicate the range of uncertainty in the status of a species.

GU: Unrankable; currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

GNR: Unranked; global rank not yet assessed.

GNA: Not Applicable; a conservation status rank is not applicable because the species is not a suitable target for conservation activities (i.e., hybrid).

?: Inexact Numeric Rank; denotes inexact numeric rank (e.g., G2?).

NRank (National Rank): National conservation status ranks in Canada are assigned similar to global ranks. The condition of a species can vary from one country to another, and national conservation status ranks document its condition in a particular country.

NX: Presumed Extirpated; species is believed to be extirpated from the nation. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.

NH: Possibly Extirpated; species occurred historically in the nation, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years

N1: Critically Imperiled; critically imperiled in the nation because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation.

N2: Imperiled; imperiled in the nation because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation.

N3: Vulnerable; vulnerable in the nation due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

N4: Apparently Secure; uncommon but not rare; some cause for long-term concern due to declines or other factors.

N5: Secure; common, widespread and abundant in the nation.

NNR: Unranked; national conservation status not yet assessed.

NU: Unrankable; currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

NNA: Not Applicable; a conservation status rank is not applicable because the species is not a suitable target for conservation activities (i.e., exotic or hybrid).

N##: Range Rank; a numeric rank is used to indicate the range of uncertainty about the status of the species.

?: Inexact or Uncertain; denotes inexact or uncertain numeric rank.

SRank (Subnational Rank): Subnational conservation status ranks are assigned for Ontario by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species.

SX: Presumed Extirpated; species is believed to be extirpated from the province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.

SH: Possibly Extirpated; species occurred historically in the province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years.

S1: Critically Imperiled; critically imperiled in the province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation.

S2: Imperiled; imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation.

S3: Vulnerable; vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

S4: Apparently Secure; uncommon but not rare; some cause for long-term concern due to declines or other factors.

S5: Secure; common, widespread and abundant in the province.

SNR: Unranked; provincial conservation status not yet assessed.

SU: Unrankable; currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

SNA: Not Applicable; a conservation status rank is not applicable because the species is not a suitable target for conservation activities (i.e., exotic or hybrid).

S##: Range Rank; a numeric rank is used to indicate the range of uncertainty about the status of the species.

?: Inexact or Uncertain; denotes inexact or uncertain numeric rank.

Appendix B

Plant Species List for Highway 407 Study Area

Family / Species	Common Name	Status	Location
			Jane & 407
GYMNOSPERMAE	CONIFERS		
PINACEAE	PINE FAMILY		
<i>Picea glauca</i> (Moench) Voss	White Spruce		X
<i>Picea pungens</i>	Colorado Spruce	+	X
<i>Pinus sylvestris</i> L.	Scots Pine	+	X
LILIOPSIDA	MONOCOTS		
POACEAE	GRASS FAMILY		
<i>Bromus inermis</i> Leyss.	Smooth Brome Grass	+	X
<i>Dactylis glomerata</i> L.	Orchard Grass	+	X
<i>Phalaris arundinacea</i> L.	Reed Canary Grass		X
<i>Phleum pratense</i> L.	Timothy	+	X
<i>Phragmites australis</i> (Cav.) Trin. ex Steud.	Common Reed	+	X
<i>Poa pratensis</i> L.	Kentucky Blue Grass	+	X
TYPHACEAE	CATTAIL FAMILY		
<i>Typha angustifolia</i> L.	Narrow-leaved Cattail		X
MAGNOLIOPSIDA	DICOTS		
ACERACEAE	MAPLE FAMILY		
<i>Acer negundo</i> L.	Manitoba Maple		X
ANACARDIACEAE	CASHEW FAMILY		
<i>Rhus typhina</i> L.	Staghorn Sumac		X
APIACEAE	CARROT FAMILY		
<i>Daucus carota</i> L.	Wild Carrot, Queen Anne's Lace	+	X
<i>Pastinaca sativa</i> L.	Wild Parsnip	+	X
ASCLEPIADACEAE	MILKWEED FAMILY		
<i>Asclepias syriaca</i> L.	Common Milkweed		X
<i>Vincetoxicum rossicum</i> (Kleopov) Borh.	Dog-strangling Vine	+	X
ASTERACEAE	ASTER FAMILY		
<i>Ambrosia artemisiifolia</i> L.	Common Ragweed		X
<i>Arctium minus</i> (Hill) Bernh.	Common Burdock	+	X
<i>Cichorium intybus</i> L.	Chickory	+	X
<i>Cirsium arvense</i> (L.) Scop.	Canada Thistle	+	X
<i>Solidago altissima</i> L.	Tall Goldenrod		X
<i>Solidago canadensis</i> L.	Canada Goldenrod		X
<i>Taraxacum officinale</i> Weber	Dandelion	+	X
<i>Tragopogon dubius</i> Scop.	Goat's-beard	+	X
BRASSICACEAE	MUSTARD FAMILY		
<i>Alliaria petiolata</i> (Bieb.) Cavara & Grande	Garlic Mustard	+	X
CAPRIFOLIACEAE	HONEYSUCKLE FAMILY		
<i>Lonicera tatarica</i> L.	Tartarian Honeysuckle	+	X
<i>Sambucus canadensis</i> L.	Common Elder		X
CONVOLVULACEAE	MORNING GLORY FAMILY		
<i>Convolvulus arvensis</i> L.	Field Bindweed	+	X
CORNACEAE	DOGWOOD FAMILY		
<i>Cornus stolonifera</i> Michx.	Red-osier Dogwood		X
CUCURBITACEAE	GOURD FAMILY		
<i>Sicyo angulatus</i> L.	Bur Cucumber		X
DIPSACACEAE	TEASEL FAMILY		
<i>Dipsacus fullonum</i> L.	Teasel	+	X
ELAEAGNACEAE	OLEASTER FAMILY		
<i>Elaeagnus angustifolia</i> L.	Russian Olive	+	X

Family / Species	Common Name	Status	Location
			Jane & 407
FAGACEAE	BEECH FAMILY		
<i>Quercus macrocarpa</i> Michx.	Bur Oak		X
FABACEAE	PEA FAMILY		
<i>Lotus corniculatus</i> L.	Bird-foot Trefoil	+	X
<i>Medicago lupulina</i> L.	Black Medic	+	X
<i>Melilotus alba</i> Medic.	White Sweet-clover	+	X
<i>Melilotus officinalis</i> (L.) Pall.	Yellow Sweet-clover	+	X
<i>Vicia cracca</i> L.	Bird Vetch	+	X
JUGLANDACEAE	WALNUT FAMILY		
<i>Juglans cinerea</i> L.	Butternut		X
<i>Juglans nigra</i> L.	Black Walnut		X
LYTHRACEAE	LOOSESTRIFE FAMILY		
<i>Lythrum salicaria</i> L.	Purple Loosestrife	+	X
MORACEAE	MULBERRY FAMILY		
<i>Morus alba</i> L.	White Mulberry	+	X
OLEACEAE	OLIVE FAMILY		
<i>Fraxinus americana</i> L.	White Ash		X
PLANTAGINACEAE	PLANTAIN FAMILY		
<i>Plantago major</i> L.	Broad-leaved Plantain	+	X
POLYGONACEAE	BUCKWHEAT FAMILY		
<i>Polygonum cuspidatum</i> Sieb. & Zucc.	Japanese Knotweed	+	X
<i>Rumex crispus</i> L.	Curly Dock	+	X
RHAMNACEAE	BUCKTHORN FAMILY		
<i>Rhamnus cathartica</i> L.	Common Buckthorn	+	X
ROSACEAE	ROSE FAMILY		
<i>Potentilla norvegica</i> L.	Rough Cinquefoil		X
<i>Prunus virginiana</i> L.	Choke Cherry		X
<i>Rubus idaeus</i> L.	Wild Red Raspberry		X
SALICACEAE	WILLOW FAMILY		
<i>Populus balsamifera</i> L.	Balsam Poplar		X
<i>Populus deltoides</i> Marsh	Cottonwood		X
<i>Salix fragilis</i> L.	Crack Willow	+	X
ULMACEAE	ELM FAMILY		
<i>Ulmus pumila</i> L.	Siberian Elm	+	X
URTICACEAE	NETTLE FAMILY		
<i>Urtica dioica</i> L. subsp. <i>gracilis</i> (Ait.)	American Stinging Nettle		X
VITACEAE	GRAPE FAMILY		
<i>Parthenocissus inserta</i> (A. Kerner) Fritsch	Virginia Creeper		X
<i>Vitis riparia</i> Michx.	Riverbank Grape		X

+ - Non-native species